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TABLE OF CONTENTS

ABSTRACTS

Thromboembolism	2
Eosinophilic Peritonitis	4
Procaine in Intestinal Obstruction	5
Abdominal Aortic Homograft....	6
X-Ray Changes in S. C. Anemia .	8
Histoplasmosis	9
Kidney in Heart Failure	12
Test for Hyperthyroidism	14
Physician's Role in Alcoholism .	15

MISCELLANEOUS

In Memoriam	17
Professional Meetings	17
Operation "Deep Freeze—61"...	19
Aspects of Missile Operation ...	20
Medical and Dental Equipment (BuMed Inst. 6700.1B)	20
Name-Plate (BuMed Inst. 5512.2)	20
Recent Research Reports	21
From the Note Book	22

DENTAL SECTION

Pulp Capping	24
Submarine Dental Standards	25
NDS Training Program	25
"Navy Dental Corps"- New Film .	26
Personnel News	26

RESERVE SECTION

Tables of Organization	27
American Board Certifications..	30
Association of Military Surgeons	31

AVIATION MEDICINE SECTION

Cardiac Stress Two-Step Test ..	32
Middle Ear Pressure Changes ..	34
Parachute Descent and Landing .	36
Physical Disqualification.....	38
Qualifications for NATTU	38
Standard Form 88	39
Accident Reports	39

Message from the Surgeon General 40

Thromboembolism

Little has been added to the century-old concept, as proposed by Virchow, of the fundamental thrombotic changes which may lead to pulmonary embolism. Resting on the postulates which he proposed, the factors involved are: (1) trauma to the vein wall, (2) venous stasis, and (3) changes in the coagulability of the blood.

Over the course of years, the authors have become impressed with the vagaries in signs and symptoms of both venous thrombosis and pulmonary embolism and with the frequent inability to make a definitive clinical diagnosis of these entities. Although results with anticoagulant therapy of thromboembolic disease seem to have been responsible for salvage of patients who might otherwise have died from fatal pulmonary embolism, the total number of deaths from pulmonary emboli has shown little alteration, largely because of failure to diagnose the majority of thromboembolic phenomena prior to the patient's death from embolism. In addition, the clinical impression of the authors is that the nonspecific measures (oxygen and papaverine) presently available for treatment of the acute phase of pulmonary embolism have not altered the immediate mortality; anticoagulant therapy following pulmonary embolism is of value only in prevention of subsequent emboli in a patient who has not succumbed to the first embolus.

Impressed by the fact that the true frequency of pulmonary embolism (and, therefore, venous thrombosis as well) is much higher than most clinicians realize, the authors conducted a survey of cases of pulmonary embolism diagnosed at autopsy. The objectives were: (1) to attempt improvement of clinical diagnostic accuracy; (2) to clarify treatment philosophy; and (3) to accumulate more information concerning epidemiologic factors.

During the 10-year period, 1945 - 1954, there were 4,391 complete autopsies, excluding stillbirths. Of this group, 606 (13.8%) had pulmonary arterial emboli. The embolus was thought to be the sole immediate cause of death in 198 patients, a contributory factor in 190, and of minor significance in 218 patients.

Since 80% of patients with "minor" pulmonary emboli had no clinical signs, the information on clinical manifestations of pulmonary embolism was restricted to those patients with significant emboli. The occurrence is:

<u>Signs and Symptoms</u>	<u>Episodes</u>	<u>Percentage</u>
No definitive sign or symptom	137	27
Dyspnea	291	58
Shock	138	28
Chest pain	110	22
Chest pain, dyspnea	75	15
Chest pain, hemoptysis	29	6
Chest pain, dyspnea, hemoptysis	14	3

(continued)

<u>Signs and Symptoms</u>	<u>Episodes</u>	<u>Percentage</u>
Physical signs	29	6
Friction rub	16	3
Hemoptysis	54	11

Cough and fever were infrequent, and tachycardia and leucocytosis presented so much difficulty in interpretation that these features were considered of little diagnostic value in the usual patient.

Because so few of these episodes of pulmonary embolism were diagnosed or even suspected, roentgenograms taken in some direct time relationship to the embolic episode were infrequent. Of 60 cases in which films were made—those with characteristic clinical picture—findings were entirely negative in 11, suggestive in 19, and indicative of some pulmonary disease in the remainder (pneumonia, pleural effusion, atelectasis, or carcinoma). The roentgen findings in pulmonary embolic disease are entirely nonspecific in the usual case and represent the changes of pulmonary infarction. The x-ray diagnosis of pulmonary embolism without infarction is difficult, if not impossible, to make.

Only 19% of patients had any clinical sign which should have brought about a diagnosis of deep venous thrombosis. In 34.9% of those patients with a positive clinical diagnosis of deep venous thrombosis, a definitive clinical diagnosis of pulmonary embolism was made during life. However, only 3.9% of all pulmonary emboli were diagnosed in patients not having an associated diagnosis of venous thrombosis. This observation suggests that clinicians are reluctant to diagnose the possibility of pulmonary embolism in the absence of prior signs in the leg veins.

The study has shown that at least one patient of every 5 with deep venous thrombosis will have a pulmonary embolus. Of all patients with pulmonary embolism, the mortality rate is reported as about 18%.

Knowledge concerning the true location of venous thrombi capable of producing pulmonary embolism is of critical importance in the proper assessment of the relative value of anticoagulants and vein ligation as therapeutic measures. From observations and various reports, surgical ligation of the superficial femoral veins does not appear to be basically sound since a large percentage of thrombi have been found to occur in locations where such a procedure would not have prevented subsequent pulmonary embolism.

Clinical differentiation of phlebothrombosis from thrombophlebitis on the basis of embolic potential is not only valueless but dangerous, contend the writers, concurring with opinions of various other clinicians.

In relation to physical examination of the chest, the authors conclude that physical signs, particularly rales, will be present in an appreciable proportion of patients if the patient is carefully followed with repeated examinations. No physical sign is considered specific, including friction rub.

Fortunately, many patients have "premonitory" nonfatal pulmonary emboli before the fatal embolic episode. A more vigorous approach to the diagnosis and anticoagulant treatment of this group of patients may save many from a subsequent fatal embolus. With the present state of knowledge, the approach must be an epidemiologic one with serious consideration for a program of active prophylactic therapy in a selected group of patients.

As described earlier, x-ray examination offers no consistent or specific findings to aid in diagnosis, and no other laboratory determination provides any reliable criteria for establishing the diagnosis of pulmonary embolism. The electrocardiogram is limited, but its value has been underestimated because when specific changes are present soon after a probable episode, support for the diagnosis is given.

With the present state of knowledge, treatment of one specific pulmonary embolic episode is restricted to supportive measures, such as narcotics, oxygen, vasopressors, atropine, papaverine, and aminophylline. There is no evidence that any of these agents have any effect on ultimate survival. The value of anticoagulant therapy is in the possible prevention of subsequent pulmonary emboli in a patient whose existing embolus proves to be nonfatal. Prevention of secondary infection of a pulmonary infarct is rational and valuable, but has no effect as far as the acute episode is concerned. Similarly, it is unlikely that specific operative therapy will play a very useful role.

The authors believe that anticoagulants have a real place as "prophylactic" agents in venous thrombosis and nonfatal pulmonary embolism. The present tendency in clinical medicine has been to confine anticoagulant therapy to patients with clearly established thromboembolic disease. To accomplish a greater salvage of patients, the clinician must assume much greater clinical awareness of the frequency of thromboembolism and be willing to make a presumptive diagnosis and treat with anticoagulants on the basis of suspicion alone. (Coon, W. W., Collier, F. A., *Clinicopathologic Correlation in Thromboembolism: Surg. Gynec. & Obst.*, 109: 259-269, September 1959)

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Eosinophilic Peritonitis

Eosinophilic infiltration of tissues or organs, for which no causal factor can be determined, may occur particularly in association with eosinophilic leukocytosis. During the past two decades reports have indicated that eosinophilic infiltration of the wall of the gastrointestinal tract may produce severe symptoms, often leading to surgical intervention. Various lesions have been described—gastroenteritis, peritonitis, and inflammatory fibroid polyp leading to intestinal obstruction—and peripheral eosinophilia is not always present.

During review of 30 cases of eosinophilia of obscure nature seen by the authors during the preceding 12 years, it was noted that 10 patients had experienced gastrointestinal symptoms. In 3 patients, laparotomy had disclosed

no gross abnormality that would account for the symptoms, yet upon microscopic examination eosinophilic infiltration of the serosa of the duodenum, jejunum, or appendix had been found. In addition, one patient with gastrointestinal symptoms associated with leukocytosis but no eosinophilia had been encountered in whom laparotomy revealed thickening of the small bowel and eosinophilic infiltration of the serosa of the ileum and appendix.

The cases presented a uniform pathologic picture, but varied clinical manifestations. In one case abdominal pain was the sole complaint. Another patient suffered abdominal pain, vomiting, diarrhea, one episode of ascites with large numbers of eosinophils in the ascitic fluid, and recurrent episodes of marked fluid retention requiring the use of diuretics. In another instance, abdominal pain, vomiting, and diarrhea were the only symptoms. The symptoms in all 4 patients were episodic with periods of remission varying from several weeks to a year or more.

Although not conclusively established, it was considered that the eosinophilic infiltration of the gastrointestinal tract demonstrated in the specimens removed at biopsy was responsible for the symptoms.

No surgical procedure or therapeutic agent was uniformly successful. Adrenal steroids were only of short-term benefit when employed. Symptomatic and supportive therapy appeared to be of most value in management of these patients.

The presence of necrotizing angiitis of the hypersensitivity type involving the serosal vessels suggests that eosinophilic peritonitis may be allergic in nature. In one case, definite allergy to certain foods was demonstrated. As more exacting immunologic techniques than are now available are developed, it may become possible to demonstrate an allergic basis for this entity. (Harley, J. B., Glushien, A. S., Fisher, E. R., Eosinophilic Peritonitis: *Ann. Int. Med.*, 51: 301-308, August 1959)

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Procaine in Intestinal Obstruction and Ileus

Beginning in early 1957, the author accumulated evidence from observation of many varied cases that convinced him of the effectiveness of procaine hydrochloride, introduced into the gastrointestinal tract or into the peritoneal cavity, in diagnosing and treating mechanical intestinal obstruction and ileus.

It appears that this agent directly affects the postganglionic fibers of the parasympathetic nervous system which arise from cells situated in, or in close proximity to, the innervated organ, resulting in increased tone and motility of both the small and large intestine.

Experimentally, procaine hydrochloride has been injected intraperitoneally, resulting in inexcitability of the splanchnic and vagus nerves and allowing peristalsis to occur.

Also it has been observed that under the influence of procaine hydrochloride there is a relation to the suppression or exclusion of the "slow" impulse which was experimentally observed under the chemical stimuli on its receptors of the intestines, and the "quick" impulse arising upon stimulation of the Vater Pacinian corpuscles.

A speculative generalization has led some to speak of the activities of the sympathetic divisions as catabolic and the parasympathetic divisions as anabolic.

In the cases presented, doses of 2 to 10 ml. of 1 or 2% procaine hydrochloride were introduced into the alimentary canal by means of a Levine tube, through a cecostomy opening, or directly into the peritoneal cavity by means of an abdominal catheter. Occasionally, prostigmine was used.

From results described, it would appear that the technique can be used as a diagnostic sign in differentiating between intestinal obstruction and ileus. If motility, including peristalsis, is initiated within seconds to minutes, maintains or increases its tones, or disappears yet recurs with additional introduction of the agent, it may be concluded that surgical intervention is not required immediately. It is assumed that there is temporary inhibition of the peristalsis of myogenic or neurogenic origin.

Injected immediately after a gastrointestinal operation or secondary to an earlier operation in an attempt to initiate early intestinal motility, procaine hydrochloride has been used with success. Postoperative alimentation may be established much earlier with this procedure than without it.

Prognosis of intestinal activity can be determined early by this means, obviating the need for operation in some instances, or establishing the need for surgery in others. Therapeutically, peristalsis can be initiated earlier in the management of ileus due to either intrinsic or extrinsic factors. (Frankel, L. A., Mechanical Intestinal Obstruction and Ileus: Use of Procaine Hydrochloride in Differential Diagnosis and as a Therapeutic Agent: J. Internat. Coll. Surg., 32: 135-142, August 1959)

Results in Abdominal Aortic Homograft Replacement

Patients with aneurysm of the abdominal aorta should be advised to have resection of this lesion if (1) operative mortality is low, and (2) chance for long-term survival is enhanced. The authors studied the results of 110 patients with abdominal aortic aneurysms who underwent surgical exploration and replacement with homograft in an attempt to provide justification for these qualifications. All cases occurred during the 4-year period following May 1953; none received replacement with synthetic materials. Study relative to the use of synthetic materials will be later, due to their relatively recent introduction.

Of the total group of 110 patients who had excision and homograft replacement of abdominal aortic aneurysms, 104 came to surgery with intact aorta. Of that group, there were 15 deaths with a mortality rate of 14.4%. Three patients with rupture of the aneurysm died before leaving the hospital.

Of the 18 hospital deaths, 8 (44%) were due to postoperative hemorrhage related to the homograft, 5 being due to rupture of some portion of the wall, and 3 showed hemorrhage from the suture lines. Among the 7 hospital deaths resulting from causes not related to the graft, 2 were not autopsied, 2 died from renal failure, gangrene of the intestine occurred in 2, and one developed myocardial infarction in the third postoperative week.

Follow-up of the 91 patients who left the hospital disclosed a total of 8 late deaths over the 4-year period considered. Failure of the homografts accounted for 3, one occurred two and one-half years later, and 2 developed one and one-half years later. In the other 5 cases, the grafts were found to be secure and patent. There were no late deaths among the 3 patients with ruptured aneurysm who survived emergency operations.

The incidence of early operative deaths following elective resection and graft replacement of abdominal aortic aneurysms, as reported in most series, ranges from 10 to 20%. Judging from the results of the present series, it would appear that after the patient leaves the hospital his chance of survival approximates that of the normal population age comparable to that estimated for the group studied.

A surprising and important finding in the review of both early and late deaths in the present series has been the number of deaths resulting from complications in the homograft. Because of this experience, cloth prostheses have been adopted exclusively for aortic replacement in the clinic of the study and may prove advantageous in avoiding the problem of graft failure encountered with homografts.

It is of interest that all of the 3 grafting failures which caused late deaths presented as severe gastrointestinal hemorrhage, false aneurysms having formed and ruptured into the retroperitoneal duodenum. (Sheranian, L. O., Edwards, J. E., Kirklin, J. W., Late Results in 110 Patients with Abdominal Aortic Aneurysm Treated by Resectional Placement of Aortic Homograft: Surg. Gynec. & Obst., 109: 309-314, September 1959)

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Please forward requests for change of address for the News Letter to: Commanding Officer, U.S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

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Roentgen Changes in Sickle Cell Anemia

Sickle cell anemia is almost exclusively limited to the Negro race. Its manifestations are diffuse so that no tissue or viscus is spared from its involvement in the human host. The condition is of interest particularly to physicians practicing in the south where the concentration of the disease is at its highest. The current report is an analysis of the clinical and roentgenologic aspects of 16 case studies.

Cardiac enlargement was the most common finding. This was generalized and, if associated with a prominent outflow tract, rheumatic heart disease was often erroneously assumed to be present. Not infrequently, various pleuropulmonary densities were identified, compatible with pneumonitis, infarct, or linear atelectasis. A slightly elevated hemidiaphragm suggestive of hepatomegaly was also seen.

In examination of the abdominal region, small bowel ileus was a frequent finding. Lienohepatomegaly and cholelithiasis were observed as concomitant occurrences.

A fairly diffuse granular appearance was identified throughout the calvarium. This impression was chiefly gained from the mottled porosity of the diploic architecture. In the other peripheral bones, osseous changes were variable. In the order of importance they were: (1) generalized change in bone architecture—irregularity of endosteum, diffuse porosis, faint linear or oblique dense bands, localized zones or radiolucency, or sclerosis; (2) growth arrest lines; (3) periosteal elevation; (4) disturbed cortex medullary ratio; and (5) in small bones, diffuse porosis in sharp contrast to the disturbed pattern of residual striae.

In the joints, epiphysitis and aseptic necrosis were not infrequent findings. This was particularly true of the hip as a weight bearing joint, resulting in coxa plana. The vertebrae presented reduction of height and broadening of transverse diameter with biconcave plate impressions.

All of the patients had an anemia with an average red blood cell count of 2.2 million/cubic mm. and an average hemoglobin of 65%. There was no relationship between the degree of anemia and severity of clinical symptoms.

The typical clinical course is that of alternate periods of remission and recrudescence. With progression and worsening of the patient's general state, a typical crisis may be expected. At the peak of one of these violent cyclic attacks, the patient may experience pain anywhere in the body, mimicking almost any clinical syndrome. This leads to various roentgen examinations and cooperative efforts with the clinician for diagnosis. The dictum, "to think of sickle cell anemia is to diagnose it," certainly holds true.

In a sickling crisis, erythrocytolysis becomes acute, and is associated with leukocytosis, fever, pain, and cardiac insufficiency. When abdominal pain is severe and an adynamic ileus is visualized, the erroneous diagnosis of an acute emergent abdomen may be made. Frequently, a crisis is precipitated

by pneumonitis. Occasionally, it is difficult to distinguish pneumonitis from atelectasis or pulmonary infarction. Arterial thromboses are the cause of these varied pleuropulmonary densities, as well as the bizarre bone densities and epiphyseal osteochondritis.

The differential diagnosis includes almost the entire gamut of the syndromes of clinical medicine, principal among which are: (1) osteochondritis; (2) anemia, Cooley's type or hemolytic erythroblastic; (3) hypothyroidism, cretinism, or Cushing's syndrome; (4) Gaucher's or caisson disease; (5) leukemia, hemangioma, or osteomyelitis; (6) xanthomatosis, neurofibromatosis, senile osteoporosis; (7) chondrodystrophia or lues; and (8) rheumatic disease. (Deibert, K. R., Roentgen Changes in Sickle Cell Anemia: Am. J. Roentgenol., 82: 501-504, September 1959)

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Course and Prognosis of Histoplasmosis

Prior to 1935 histoplasmosis was diagnosed solely by the pathologist at postmortem examination. Since then an increasing number of nonfatal cases have been described. In 1945 Christie and Peterson first demonstrated that the distribution of histoplasmin sensitivity correlates closely with geographical areas having a high incidence of nontuberculous pulmonary calcifications. Surveys of histoplasmin skin sensitivity in various parts of the United States have shown that a benign form of histoplasmosis is common in certain endemic areas and accounts for the overwhelming majority of all *Histoplasma* infections. It has been estimated that 30 million people in the United States are infected with *H. capsulatum*. The spectrum of illness varies from asymptomatic infection with residual skin test sensitivity to disseminated fatal disease. The frequency of each clinical variety is not known, although mild respiratory illness due to primary infection is probably common in the endemic area.

In 1948 the chronic pulmonary form of histoplasmosis was described. Since that time this form of the disease has been reported more frequently. Interest in this manifestation of the disease has increased because chronic pulmonary histoplasmosis is clinically and radiographically indistinguishable from reinfection type pulmonary tuberculosis. The prevalence of chronic pulmonary histoplasmosis in tuberculosis sanatoriums in endemic areas has been estimated at 10%.

The present report is an analysis of this disease on the basis of 123 culturally proved cases of different clinical varieties.

Acute pulmonary histoplasmosis is almost invariably a benign infection, only rarely going on to more progressive disease. The present series contains 8 such cases, 7 being of the "epidemic" variety. The latter cases are

usually associated with a "point source" of infection—usually unused chicken coops or caves, and damp shaded areas of soil. The clinical severity of this type of infection correlates well with the time and intensity of exposure to the point source. Seven of the 8 cases of that type in this series were of this severe form with all patients being alive after follow-up periods averaging 3 years.

Initial cultural diagnoses were made from sputum in 3 cases, gastric washing aspirate in 3, and from pleural fluid and tonsil tissue in one each. None of 15 blood cultures and 3 bone marrow cultures from 5 patients were positive. Histoplasmin skin tests were positive in 6 of the 8 patients. Only one had a positive reaction to the tuberculin skin test, as well as the histoplasmin skin test. Complement fixation tests were positive during acute illness in all. Titers ranged from 1:8 to 1:64. In 3 patients serologic tests were persistently positive for more than one year after the acute clinical episode had subsided.

The duration of clinical illness ranged from 19 days to 3 months. Fever was present in all cases. The predominant symptoms were cough, chest pain, chills, sweats, and dyspnea. Physical findings were scant. White blood cell counts ranged between 8,000 and 14,000 cells per cu. mm. In 7 patients chest roentgenograms showed diffuse nodular densities; in the eighth there was local and pneumonic infiltration. Two patients with diffuse nodular lesions showed complete clearing in roentgenograms taken 8 months and 2 years after the initial examination; all others continue to show nodular densities and calcifications.

Demonstration of calcifications in liver and spleen of patients with inactive histoplasmosis supports the concept of blood-borne dissemination at the time of the primary infection. The overwhelming majority of patients show no evidence of this primary dissemination beyond residual histoplasmin sensitivity and healed calcifications.

Disseminated cases of histoplasmosis were the first clinical type to be recognized and, since all the earliest cases described were fatal, it was assumed that this disease was uniformly fatal. All of the 25 cases in this series demonstrated clinical evidence of systemic dissemination to other organs—liver, spleen, mucous membrane, and adrenal glands. Only 6 patients survived, 3 having been treated with amphotericin B.

Blood was the most frequent source of culturally positive material from which the diagnosis was first made during life; next in order was sputum, then material from gastric washings. Three cases were diagnosed initially by cultures of biopsy specimens of tissues obtained from oral, laryngeal, and lingual ulcers. Positive reaction to skin tests was shown by 14 of the 25 patients; only 11 reacted to histoplasmin. This observation possibly is a reflection of the clinical severity of the disease, with resulting anergy. Results of complement fixation tests were positive in 14 of the 23 patients in whom they were performed.

The most common symptom in this group was fever, occurring in all with weight loss, cough, chills, fatigue, weakness, and anorexia occurring

in this order of frequency. A palpable liver and spleen were evident in 17 patients. White blood cell counts and hemoglobin determinations were within the normal range in more than one-half of the cases. Chest roentgenograms were normal in 7 patients, 9 showed diffuse nodular infiltrates in both lung fields, 7 demonstrated discrete pneumonic infiltrations, and 2 had cavitory disease.

When dissemination from the lungs occurs the organs most frequently involved are those containing large numbers of reticuloendothelial cells—spleen, liver, and lymph nodes. Adrenal involvement is common, with 20% in this series showing Addison's disease. Four patients with this complication died and the one survivor continues to be maintained on 5 mg. of prednisone daily. Present experience and that quoted in literature indicate that mucocutaneous lesions usually indicate disseminated disease, although they may be the only lesions insofar as can be determined. Such cases may have a prolonged course with poor prognosis.

The largest number of cases included in this analysis are of the chronic pulmonary variety—90 patients. The majority were hospitalized in a tuberculosis sanatorium at some time during the course of their illness. The disease was fatal in 16, pulmonary disease was responsible for death in 9, while 4 died following pulmonary surgery. The average duration of illness was 69 months.

Initial cultural diagnosis was made from sputum in 79 cases, lung tissue in 7, fluid from bronchial washings in 3, and material from gastric washings in one case. Reactions to histoplasmin skin tests were negative in 20% of the 90 culturally proved cases. Reactions to tuberculin skin tests were positive in 41%. These findings do not detract from the value of the histoplasmin skin test as a clinical and epidemiologic tool, but they do indicate that a negative result of a skin test does not rule out the diagnosis. Complement fixation tests were positive in 79 patients (91%).

The clinical picture is that of a chronic pulmonary infection indistinguishable from any other, including tuberculosis. Cough, weight loss, dyspnea, and fever were the most frequently occurring symptoms, with chest pain and hemoptysis occurring in nearly one-half of the patients. Significant physical findings in this group also were infrequent. Of the laboratory studies, only the sedimentation rate was consistently elevated—93% showing values above 10 mm. per hour.

Chest films revealed cavities in 78 (87%) of the 90 patients, located in the apex or subapex in 77 patients. Of this group 28% presented bilateral cavities, and 38% had multiple cavities in the upper lobe. Of this group 87 were followed by x-ray, 43 showed x-ray progression, 43 remained stationary, and only one showed improvement. The percentage showing x-ray progression was directly proportional to the length of time of follow-up.

Late stage developments of the chronic form of this disease include bronchiectasis, probably incident to bronchial obstruction. Seven of this series showed this development. Six patients developed emphysema and 2 developed bronchopleural fistula and empyema.

Some descriptions of this chronic pulmonary form of the disease have stressed its progressive nature. Another concluded that "the course is benign and is not altered by medical therapy." The present analysis clearly illustrates the progressive nature of this disease, although many may show varying periods of clinical remission. With recent advances in therapy of the deep mycoses, these patients need not be consigned to a progressively debilitating downhill course. (Rubin, H., et al., The Course and Prognosis of Histoplasmosis: Am. J. Med., XXVII: 278-288, August 1959)

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Role of Kidney in Heart Failure

The efficacy of treatment of congestive heart failure has surpassed knowledge of its pathologic physiology. Useful lives have been prolonged despite only fragmentary information concerning mechanisms responsible for the symptoms of the disease, or mechanisms of action of therapeutic regimens and agents employed.

The effectiveness of newer diuretic agents has led to a preoccupation with the role of the kidney in fluid retention. However, this preoccupation with the late stages of the disease, and with the role of the kidney in production of edema in congestive heart failure, has tended to obscure the evidence that changes in sodium and water metabolism are present in heart disease at a time when the cardiovascular system is only slightly impaired. The study of sequential alterations in function in the natural progressive course of the syndrome would help differentiate the primary changes from secondary abnormalities, and determine whether the changes in sodium metabolism are part of a compensatory process or merely the deleterious effects of circulatory insufficiency.

In producing anatomical disease in dogs similar to those observed in human beings, the authors have attempted to define some steps in the development of the manifest physiologic changes in congestive heart failure. Although gross clinical evidence of sodium retention is first noted in the dog with frank failure, slight but definite alterations in sodium excretion can be detected even with the mildest of these valvular lesions—pulmonary insufficiency. Incident to slight change, decrease in sodium excretion is noted in an animal with normal venous pressure and normal basal glomerular filtration rate. Such evidence suggests that alterations in peak capacity for sodium excretion may be a far earlier concomitant of cardiac impairment than is now supposed. Increasing the severity of cardiac damage produces a progressive decrement in the rate of sodium excretion following saline infusion. Up to a point, despite reduced ability to excrete a sodium load and an increased total exchangeable sodium, ascites and edema do not develop. Moreover, the basal glomerular filtration rate may be normal even in the animal

with frank congestive failure. This fact suggests that increased tubular reabsorption of sodium is a significant factor.

Following the work of Merrill in 1946, emphasis was placed on the role of the reduced glomerular filtration rate in the pathogenesis of sodium retention of congestive heart failure. Other reports soon indicated that filtration rate was not invariably reduced in patients with heart failure and that clinical improvement may occur without rise in filtration rate. Recently, attention has been focused on the salt-retaining hormone of adrenal cortical extract—aldosterone. Here again, consistency of effects is lacking as it has not been shown that urinary aldosterone is elevated in all edematous patients. Although the mineralocorticoids have long been known to play an important role in maintenance of normal sodium balance, the direct renal effect of the steroids has not been shown.

Speculation has long existed concerning the possible role of renal nerves in alterations of renal function in congestive heart failure. The function of renal nerves, however, is a confusing area of renal physiology. Most evidence to date minimizes their importance in control of renal function. However, the authors' experiments seem to indicate that some mechanism of control by renal nerves influences blood flow, filtration rate, and electrolyte interchange.

Demonstration of increased sympatho-adrenal activity on the kidney in valvular heart disease raises the question of the nature of the initiating mechanism. Sodium retention is found in a number of diverse conditions in which there is a reduction in effective circulating blood volume and a tendency toward a decrease in arterial pressure. Under such conditions carotid sinus activity is decreased, leading to reflex vasoconstriction and restoration of blood pressure. Experiments in various laboratories yield observations which offer evidence for the possible role of the carotid sinus as the receptor organ initiating the reflex increase of sympatho-adrenal tone in the kidney in congestive heart failure. Ultimately, it is hoped to be able to demonstrate progressive decline in rate of discharge of baroreceptors of the carotid sinus as an animal is followed through the various stages of cardiac impairment to frank failure.

If there is a progressive decrease in rate of discharge from the carotid sinus with progressive impairment of cardiac function, then a common receptor mechanism may be responsible for both the increased sympathetic activity and for hypersecretion of aldosterone. Thus, the carotid sinus may regulate mineralocorticoid activity of the adrenal gland as well as sympatho-medullary function. Undoubtedly, other mechanisms play a role in the normal regulation of sodium balance and the sodium retention of congestive heart failure. Further work may help to elucidate the interrelationship of these factors in congestive heart failure and other forms of circulatory stress. (Barger, A. C., Muldowney, F. P., Liebowitz, M. R., Role of the Kidney in the Pathogenesis of Congestive Heart Failure: *Circulation*, XX: 273-285, August 1959)

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Diagnostic Test for Hyperthyroidism

At the beginning of the present century a keen interest developed in the physiologic properties of the recently discovered hormones of the adrenal medulla and thyroid. Concepts that potentiation by thyroid hormones of the physiologic effects of epinephrine, and existence of interrelationships of the adrenal medulla, sympathetic nervous system, and thyroid developed. In 1918 a diagnostic test for hyperthyroidism based on these relationships was proposed. Following injection of epinephrine, an increase in heart rate, rise in blood pressure, and development of tremor and palpitations indicated the presence of hyperthyroidism. However, alarming reactions were observed frequently with the result that the test was considered to be unsatisfactory and soon became unpopular.

Ample proof exists that hemodynamic and metabolic responses to epinephrine are strikingly altered by variations in the levels of the thyroid hormones. Data accumulated by the authors have proved that potentiation of action of the catechol amines is not due to the increased metabolic rate which is an almost constant feature of hyperthyroidism. All known facts strongly suggest that the concentration of the circulating thyroid hormone controls the response to both epinephrine and norepinephrine. At the same time thyroid hormone is not the only hormone which conditions physiologic response to these agents. The presence of adrenal steroids is known to be necessary for the proper action of the catechol amines. The site of interaction, as well as the exact chemical relationship, has not been satisfactorily defined.

Recent emphasis in the diagnosis of hyperthyroidism has been on tests utilizing the uptake of radioactive iodine by the thyroid gland or the level of serum protein-bound iodine, while the basal metabolic rate has fallen into disuse. The accuracy of the former two tests exceeds that of the latter, but in addition to expense, they too are subject to certain features of unreliability. For these reasons it is not unusual for the clinician to have occasional difficulty in resolving the diagnosis of thyrotoxicosis.

Another determination of thyroid function which can operate in the face of the difficulties with other tests should be welcome. For this purpose, response to epinephrine can be used. Demonstrated in the work of this report, changes in both oxygen consumption and hemodynamics can be used to separate hyperthyroid from euthyroid persons. A sharp separation of these two groups can be achieved by the change in the product of heart rate and pulse pressure to an infusion rate of epinephrine of $0.05 \mu\text{g/kg. /minute}$. This dosage of epinephrine was selected after observation of effects of serial dilutions because it was found capable of producing significant changes in oxygen consumption, heart rate, and blood pressure of thyrotoxic patients without being likely to produce disturbing symptoms. Caution is necessary, for thyroid storm and fatal disturbances in cardiac rhythm have been precipitated by epinephrine.

The authors contend that the epinephrine test is simple to perform, provides a high degree of specificity in distinguishing hyperthyroidism, and

should be useful in clinical practice. (Murray, J.F., Kelly, J.J. Jr., The Relation of Thyroidal Hormone Level to Epinephrine Response - A Diagnostic Test for Hyperthyroidism: Ann. Int. Med., 51: 309-321, August 1959)

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Alcoholism and the Medical Profession

Alcoholism has been known and recognized as an illness for many years. In the remote past, as well as more recently, a number of physicians have recognized this illness as a medical problem. Until comparatively recently, however, the organized profession has done very little about it. The attitude of medical organizations might have been due to the influence of the general public which looked upon alcoholism more as a moral problem than a medical one.

Although not the first to hold this view, the Commissioner of Health of Buffalo at the turn of the century addressed the City Council on the problem of excessive drinking and stated his opinion that it was an illness and not a crime to be an alcoholic. He recommended that jail sentences meted out to correct the problem be changed to hospitalization so that alcoholics could get medical care and proper rehabilitation. However, his words fell on disinterested ears.

Not until 1948 were any real steps at organized effort achieved to educate the public and the medical profession. The impetus was initiated in the County Medical Society of Erie County, N. Y., with the American Medical Association entering the picture in 1950. Since then, although with a slow beginning, greater and greater momentum has been built up. At present, the Committee on Alcoholism of the Council on Mental Health of the American Medical Association of which the author is the Chairman is making great strides in evaluation of the situation throughout the country. This includes education of physicians, nurses, medical school deans, hospital administrators, hospital insurance officials, and all possible agents involved directly or indirectly in the attack on the problem of chronic alcoholism.

The individual physician must recognize his responsibility in his own community to the patient suffering from alcoholism. He can no longer avoid the issue. He can no longer neglect these patients. He cannot "pass the buck." He must treat them. There is sufficient evidence that good results can be obtained. Cures cannot be promised since a cure would imply that the patient might be able to drink normally again. However, complete recovery can be attained by the patient with the help of his physician. To this end the doctor must work. Properly trained in the medical approach and with sufficient psychiatric orientation, very satisfactory results can be obtained with most patients. It must be recognized that there is no specific routine for this disease. There is no antibiotic or chemical miracle drug which will do away with the illness.

The physician must spend sufficient time with his patient. He must not only rehabilitate him physically, but must help him to mature emotionally. The physician must study this disease as he does other diseases, its etiologic factors, background, and history. He must make definite evaluations and pursue therapeutic programs with thoroughness and understanding. If postgraduate courses on this disease are not available in any specific area, the Committee on Alcoholism stands ready to help in this matter, working through local associations.

As with other diseases, the answer to this problem lies in prevention rather than in therapy. By instituting proper prophylactic measures and by careful advice, many cases of alcoholism can be prevented. It is never too early to detect signs of impending or incipient alcoholism. Constant awareness of the problem is mandatory.

In addition to the practicing physician, other medical agencies must be used in combating the problem of alcoholism. The general hospital should accept these patients as sick people who deserve and require attention. Acute alcoholic intoxication can be, and often is, a medical emergency. Hospital personnel should be properly instructed not only in medical and psychiatric therapies for this disease, but also in the proper attitude to be adopted toward such patients. The correct approach toward any sick person is a great step toward helping him, and the attitude of the therapist is a tremendous step toward acceptance by the patient of the help he requires.

The physician, the nurse, and members of related professions must remember that they also are citizens and as such must take an interest in their communities. Sufficient interest must be taken in the problem to engage in efforts for education in relation to the facts of alcoholism with lay groups as well as professional groups. Both physicians and nurses can carry the message of sympathy and understanding to these patients. They can help them get the kind of assistance they need and refer them to available resources for such help.

When all possible facilities are brought to bear by the physician and the ancillary professions, and there is sufficient understanding of the problem by these people, interest can be stimulated toward gaining more knowledge. As with many medical problems in the past, increased research and knowledge will eventually lead to the answers. (Block, M. A., Alcoholism and the Medical Profession: Am. J. Pub. Health, 49: 1017-1024, August 1959)

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Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, 19 June 1958.

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IN MEMORIAM

LT Edward H. Kershner MSC USN (Ret)	<u>May 1959</u> 9
LTJG William A. Thornton MSC USN (Ret)	<u>July 1959</u> 14
LCDR Albion C. Tollinger DC USN (Ret)	<u>August 1959</u> 12
CDR Loretta (n) Lambert NC USN (Ret)	17
CAPT Dunne W. Kirby MC USN	<u>September 1959</u> 7
CAPT Robert L. Wagner MC USN	7
CAPT Lesley Leak MSC USN (Ret)	9
CAPT John B. Farrior MC USN (Ret)	16
CAPT George N. Raines MC USN (Ret)	16
CAPT Trenton K. Ruebush MSC USN	26
LT Sidney W. Bond MSC USN (Ret)	30
CAPT Ramon O. Mickell DC USN	<u>October 1959</u> 6

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Navy Medical Department Participation
in Professional MeetingsArmed Services Orthopedic Seminar

The first Armed Services Orthopedic Seminar was held at the U. S. Naval Hospital, Oakland, Calif., 23 - 25 September 1959, with some 300 Medical officers of the Army, Navy, and Air Force, and their civilian consultants attending.

Exhibits of the latest Navy-developed prosthetic limbs, a resume of the research program of bone adhesive developed at the Prosthetic Research Laboratory, and a demonstration of artificial kidney with discussion of renal shut-down as a complication in the orthopedic patient were presented during the first day. Subsequent sessions were devoted to military orthopedic training, symposium on knee injuries, orthopedic research, cervical spine injuries, stereo-anatomy of the hand, and reconstructive surgery of the hand.

American College of Surgeons Convention

The Naval Medical Research Institute, National Naval Medical Center, Bethesda, Md., presented two scientific exhibits and a surgical forum paper at the American College of Surgeons convention at Atlantic City, N. J., 29 September to 2 October 1959.

The exhibits demonstrated two techniques developed in the Experimental Surgery Branch of the Research Institute which have become clinically applied at the Naval Hospital, Bethesda. The Instrumentation Division of the Institute collaborated in the design and production of much of the electronic equipment, and the Naval Research Laboratory assisted in the design and construction of the apparatus.

One exhibit was a working model of the heart-lung machine and temperature regulator which enables the viewer to control the temperature of the circulating fluid. Descriptive material was presented which showed the temperature chart of an experimental animal whose body temperature was lowered from 37°C. to 7°C. in 10 minutes.

The other exhibit pertained to a diagnostic procedure designed to visualize the coronary arteries. In order to discover the location and operability of coronary artery atherosclerosis, a radio-opaque dye is injected via a catheter placed in the aorta. An electronically powered apparatus then injects the dye during the period of maximal coronary artery filling and exposes the x-ray film before the next cardiac contraction. Coronary arteriograms employing this technique have been performed clinically in collaboration with the Department of Cardiology at the Bethesda Navy Hospital.

At the Surgical Forum a paper entitled "Differential Hypothermic Cardioplegia" was presented by Dr. H. C. Urschel and LT J. J. Greenberg MC USN. Their discussion described how cooling to temperatures below 16°C. enables the heart to be stopped for extended periods of time and allows the surgeon to operate in a bloodless and motionless field. This method, devised in the surgical research laboratory, has since been used successfully in several open heart procedures at the hospital.

American Society of Clinical Pathologists

At the meeting of the American Society of Clinical Pathologists in Chicago, Ill., during September 1959, several members of the staff of the Naval Medical School, National Naval Medical Center, Bethesda, Md., participated. LT T. C. Hartney MC USN, CDR R. M. Dimmette MC USN, and CAPT J. S. Shaver MC USN presented a paper, "No Major Reactions and Few Minor Reactions in 15,449 Blood Transfusions." CDR Dimmette, with LCDR J. E. Szakacs MC USN and CDR E. C. Coward, Jr. MC USN, presented a paper dealing with the pathology of catecholamines. LT F. W. Sunderman, Jr. MC USNR discussed "Causes for Discrepancies in Electrophoretic Fractionation of Serum Proteins." During the meeting CDR Dimmette was elected to the Council on Microbiology of the Society for a period of 3 years.

International College of Surgeons

The degree of Honorary Fellow of the International College of Surgeons was presented to RADM Bartholomew W. Hogan, Surgeon General of the Navy, during the 24th Annual Congress of the North American Federation of the

College in September 1959. At one of the sessions RADM Hogan was moderator for a symposium presented by Navy physicians—"Medical Operations and Research in Climatic and Environmental Extremes."

Association of Military Surgeons

CAPT Ruth A Houghton NC USN, Director, Nursing Division, Bureau of Medicine and Surgery, and current Chairman of the Nurse Corps section of the Association of Military Surgeons, will greet the section meeting on Monday, 9 November 1959. At this session CDR Mary C. Grimes NC USN, Head, Nurse Corps Reserve Liaison Branch of the Bureau, will preside. The program will consist of a symposium, "Ten Years of Progress," during which LT Hope McIntyre NC USNR will discuss "Improving Teaching Methods Provides Better Patient Care." Other details of Medical Department participation in the convention program appeared in the Medical News Letter of 4 September 1959.

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Volunteers Invited for Operation

"Deep Freeze—61"

RADM B. W. Hogan, Surgeon General of the Navy, has announced that regular and experienced Reserve Medical Corps officer volunteers will be needed to man the important Antarctic South Pole, Byrd, Hallet, and McMurdo Sound (Flight Surgeon) Bases for Operation "Deep Freeze—61." In April 1960, the volunteers selected will begin 7 to 8 months training in phases of medical practice particularly applicable to these stations, including: traumatic and general surgery; anesthesiology; otolaryngology; emergency dental care; cold weather medicine, hygiene, and sanitation; and polar air, ice, and water safety and survival.

Because the Medical Officer at Pole, Byrd, and Hallet Base is also the Officer-in-Charge of the station, selectees will receive training in Naval Jurisprudence, communications, administration, morale functions, and leadership.

Upon completion of training in the fall of 1960, the Medical officers will fly from Davisville, R.I. to Antarctica via Honolulu, Canton, Fiji, and New Zealand and will spend approximately one year on the ice at a base with fifteen to twenty men.

It is considered that this assignment presents an opportunity to an interested and suitable Medical officer to round out medical training, to save money, to participate in an interesting research program—biological, medical, and geophysical; and to become acquainted with the world's last frontier.

Applicants for this assignment will address letters of request, via commanding officer when applicable, to the Bureau of Medicine and Surgery, Code 31, Department of the Navy, Washington 25, D. C.

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Courses in Medical Aspects of Missile Operations

Three classes in Medical Aspects of Missile Operations will be held at the 6550th U.S. Air Force Hospital, Patrick Air Force Base, Fla., during Fiscal Year 1960. The presentation features instruction in occupational health and toxicologic problems of missile weapons systems.

<u>Class No.</u>	<u>Class Dates</u>	<u>Deadline for Requests</u>
7	11-21 Jan 1960	30 Nov 1959
8	14-24 Mar 1960	1 Feb 1960
9	9-19 May 1960	28 Mar 1960

The Navy has been allotted a quota of three members for each course. Applications are encouraged from either Medical Corps or Medical Service Corps officers, particularly those officers whose duties are with missile organizations ashore or afloat. Reserve officers will be considered, selection depending on the length of active duty remaining on present service agreement.

Secret security clearance is required on all candidates approved for attendance and must be so indicated on the official request.

Officers desiring to attend one of the courses should submit a written request to the Bureau of Medicine and Surgery via their commanding officer. Requests must be received in the Bureau by the dates indicated for each course.

Successful candidates will be issued Temporary Additional Duty travel and per diem orders from BuMed training funds.

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BUMED INSTRUCTION 6700.1B

31 August 1959

From: Chief, Bureau of Medicine and Surgery

To: Ships and Stations Having Medical/Dental Personnel

Subj: Medical and dental equipment; maintenance and repair program

The purpose of this instruction is to provide information concerning the employment of Medical Repairmen (MRM) and Dental Repairmen (DRM), and furnishes instructions relative to the procurement of repair parts and tools.

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BUMED INSTRUCTION 5512.2

1 September 1959

From: Chief, Bureau of Medicine and Surgery

To: Medical Centers, U.S. Naval Hospitals, U.S. Naval Dispensaries, and Activities Having Station Hospitals

Subj: Name-Plate identification for Medical Department personnel;
wearing of

The purpose of this instruction is the notification of requirement for all Military Medical Department personnel and all civilian employees who come in contact with patients or the public to wear name badges while performing their duties.

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Recent Research Reports

Naval Medical Research Institute, NNMC, Bethesda, Md.

1. Inhibition by Acetylsalicylic Acid of Rickettsial Strains Resistant to p-aminobenzoic Acid. NM 52 05 00.02.03, 1 May 1959.
2. Indirect Estimation of Body Surface Area and Volume. NM 31 01 00.01.01, 6 May 1959.
3. Pharmacological Studies on Irradiated Animals. VII. Protection of Guinea Pigs Against Radiation-Induced Mortality by Cell-Free Mouse Spleen Extract Stored for One Year. NM 62 04 00.03.02, 8 May 1959.
4. Enzymatic Studies on the Gelatin-Collagen-Food Transition. NM 01 01 00 .02.09, 15 May 1959.
5. The Use of Small Laboratory Animals in Medical Radiation Biology.
- VI. Lethal Effect of Co⁶⁰ Gamma Rays in Mice. NM 62 02 00.01.04, 15 May 1959.
6. Failure of Fighting to Produce Stress in Terms of Adrenal Weight in Grouped Male Albino Mice. NM 24 01 00.04.06, 15 May 1959.
7. Potable Water Recycled from Human Urine. NM 19 02 00.01.01, 29 May 1959.
8. Quantitative Aspects of 1-norepinephrine Induced Pathologic Changes. NM 71 01 21.3, August 1959.

Naval Medical Field Research Laboratory, Camp Lejeune, N. C.

1. The In Vitro Assay of Spasmolytic Agents: An Appraisal of Current Technique and Recommendations for Modification. NM 02 02 09.1.1, and NM 02 02 09.2.1, March 1959.
2. Effectiveness of Suction in Removing Venom from an Open Wound. NM 51 03 09.1.2, August 1959.
3. The Validity in a Military Setting of MMPI Scales of Dominance and Social Responsibility. NM 18 01 09.1.1, August 1959.
4. Comparison of the Radiocardiogram and Evans Blue Dye Dilution Cardiac Output Methods. NM 61 01 09.1.10, August 1959.

(To be continued)

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From the Note Book

RADM Holland Commands NAMC. RADM J. L. Holland MC USN assumed command of the Naval Aviation Medical Center, Pensacola, Fla., on 24 September 1959. When he ordered hoisted his two-starred flag it marked an important first in the long history of that training base for Naval Aviation—the first flag officer of the Navy Medical Corps to serve on active duty in Pensacola. (News Release, Naval Air Training Command, NAS, Pensacola, Fla.)

CAPT Fuller AFIP Deputy Director. Newly assigned as Deputy Director of the Armed Forces Institute of Pathology is CAPT R. H. Fuller MC USN who reported from U. S. N. Hospital, Camp Pendleton, Calif., where he served as Chief of Laboratory Service. CAPT W. M. Silliphant MC USN recently retired after having served as Director of the Institute for four years. The present director is COL F. M. Townsend USAF MC. (AFIP Letter, 1 October 1959)

Treatment of Cholera. In addition to excellent, simplified, and detailed treatment of cholera, the Research Report from U. S. Naval Medical Research Unit No. 2, Taipei, Taiwan, contains many applicable suggestions for management of dehydration from other causes. This Report also includes a simplified method for estimation of plasma protein concentration by means of determination of the specific gravity of blood, and recommendations for fluid replacement in dehydration following severe diarrhea. (Treatment of Cholera, NM 52 11 02.3.4, 1 August 1959)

Gastrointestinal Radiology. Continuing the series of Twenty-Five Years of Progress articles, the September issue of The American Journal of Digestive Diseases presents a comprehensive review of the progress of radiology in relation to the gastrointestinal tract, by F. E. Templeton of the University of Washington School of Medicine.

Prednisone in Myocardial Infarction. This report indicates that a beneficial effect results from the use of prednisone during the first two weeks following the development of myocardial infarction. Disorders of cardiac rhythm and of atrioventricular conduction in particular were reported to be diminished. Less success in case of intraventricular disorders of conduction could be expected. (G. Toja, F. Accossato, Minerva med. (It.) 50: 765, 1959)

Blood Dyscrasias and Tolbutamide. A case description is presented wherein during the course of tolbutamide therapy for diabetes mellitus a patient developed toxic bone marrow depression which, under the influence of adrenal steroids, evolved into an acute leukemia. Speculation is raised as to the relationship between tolbutamide and the fatal blood dyscrasia. (LT R. C. Brod MC USN, J. A. M. A., 19 September 1959)

Fat in Diabetes. In a group of patients with diabetes, retinopathy, and elevated serum lipids, a low fat diet resulted in a striking increase in glucose tolerance, lowering of serum lipids, and marked decrease or disappearance of fundal exudates. From these observations the author concludes that it seems justifiable to consider a strict low fat diet in diabetic patients who present elevated serum lipids and distinct retinopathy. (W. Van Eck, Am. J. Med., August 1959)

Intrathoracic Disease. In 100 consecutive cases in which scalene node biopsy was performed as an aid in diagnosis of intrathoracic disease, 60% of those with tumor had positive biopsy specimens while a diagnosis of tumor was made by the bronchoscopist in 70% of the cases. The writers justly point out that these techniques, along with cytologic study, would be more useful as complementary techniques rather than any one being employed as a single routine diagnostic tool. (A. Gaurie, G. Friedell, J. Thoracic Surg., August 1959)

Rectal Cortisol. In 16 patients with ulcerative colitis of mild or moderate degree confined to the rectum or rectosigmoid, 8 showed a satisfactory response to a series of hydrocortisone enemas. In view of the relative safety of this form of therapy, it is suggested that it should be considered as the initial steroid therapy in many patients with this disease. (R. D. Schwartz, et al., A.M.A. Arch. Int. Med., August 1959)

Intrahepatic Metastases. The determination of the rate of urinary bilirubin excretion in patients with increased serum alkaline phosphatase and normal serum bilirubin levels offers a more specific means of predicting the presence of metastatic carcinoma in the liver than do the latter two findings alone. (E. Fitzsimons, et al., J. Lab. & Clin. Med., August 1959)

Cerebral Vascular Insufficiency. Transient visual symptoms are frequently experienced by patients with intermittent insufficiency of the carotid or vertebral systems. Recognition of such prodromal symptoms is important if patients are to be treated before a frank stroke occurs. Illustrations and diagrams enhance this presentation. (W. Hoyt, A.M.A. Arch. Ophth., August 1959)

Hypertensive Emergencies. Recommendations are made for management of hypertensive crisis, employing some of the newer chemical agents. Details of parenteral therapy are given, including those for the employment of a solution of sodium nitroprusside when more conventional hypotensive agents are ineffective, contraindicated, or productive of prohibitive side effects. (R. Gifford, Proc. Staff Meet. Mayo Clin., 5 August 1959)

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DENTAL**SECTION**Pulp Capping

Many teeth that have exposed vital pulps caused by mechanical means, traumatic injury, or decay that has extended into the pulp chamber can be saved with proper use of calcium hydroxide suspensions.

Favorable conditions for pulp capping with calcium hydroxide are:

(1) a tooth with a vital pulp; (2) fresh hemorrhage from the canal; (3) roentgenographic examination revealing conditions which are normal except for the pulp exposure; (4) removal of all decay; (5) good cavity preparation, and (6) sterile field. Calcium hydroxide stimulates the formation of bridges of secondary dentin in the pulp.

In most instances, the possibility of an exposure can be foreseen. If this be so, it is imperative that the outline form be completed before excavating into the pulp chamber. The tooth should be isolated with a rubber dam, and after the outline form is completed with proper extension for prevention, smooth margins, and other operative procedures, the area should be painted with iodine tincture, merbromin, or some other equally efficient solution, and a completely fresh set of sterile instruments placed on the operating tray. Removal of the decay just over the pulpal region may or may not lead to an exposure; therefore, care must be taken during this procedure. The instruments of choice are extremely sharp excavators or round burs. If the pulp is not penetrated, the base and final restorative material should merely be inserted. In the event of an exposure, the dentist should excavate with sweeping motions until all decay is removed.

Usually, hemorrhage will cease momentarily on its own; otherwise, a sterile cotton pellet saturated with epinephrine (1:1000 concentration) will help control the bleeding. Next, the area should be cleaned with hydrogen peroxide (3%) and dried with a sterile cotton pellet. The tooth is then ready for calcium hydroxide.

Enough calcium hydroxide should be squeezed from the tube to cover the exposed area. With the back of an excavator, the calcium hydroxide should be brushed over the area. A very slow stream of warm air should be directed on the calcium hydroxide for a few seconds and then the calcium hydroxide should be gently patted into place with a dry cotton pellet. The air helps the substance set, so that it is not sticky. In order to avoid forcing any of the material into the pulp chamber, only slight pressure is exerted during this operation.

An excellent base to use over the calcium hydroxide is zinc oxide and eugenol with zinc acetate crystals added so that the base will set immediately. The final restoration should be placed at the same sitting so that a tight seal is insured. (Levin, J.J., D.D.S., J. Am. Dent. A., Vol. 59, August 1959)

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Dental Standards for Submarine Personnel

Candidates for submarine training shall conform to the dental standards herein quoted from Chapter 15-29 (f) of the Manual of the Medical Department. Particular care must be exercised in the preliminary dental examination on ships and at shore stations in order that a large number of candidates may not be rejected as a result of reexamination at the Submarine School in New London, Conn., thus avoiding needless cost of transportation, loss of service, and incomplete quota of classes.

A complete dental examination shall be conducted by a Dental officer if available. If a Dental officer is not available, the examination shall be conducted by a Medical officer. Candidates must have sufficient number of natural and/or artificial teeth to insure satisfactory masticatory and incisal function. Acute infectious diseases of the soft tissues of the oral cavity are disqualifying until remedial treatment is completed. Individuals with caries shall have all required dental treatment completed before transfer to the submarine training unit. A candidate who will require dental prosthetic restorations during the period of training should be considered not physically qualified. Malocclusion (crossbite, overjet, or overbite with or without impingement) is not cause for physical disqualification unless it interferes with incisal or masticatory function to such degree that adequate nutrition cannot be obtained from food normally served as a regular diet by a general food service. Missing teeth replaced by satisfactory bridges or dentures shall not be considered disqualifying.

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Naval Dental School's Continuous Training Program

A short course in Oral Pathology will be presented by the U.S. Naval Dental School, NNMC, Bethesda, Md., 7 - 11 December 1959, and 7 - 11 March 1960.

The course is designed to increase the knowledge of the Dental officer in oral pathology and oral diagnosis. Disturbances in developments, diseases of the oral mucosa and jaws, the oral manifestations of certain systemic diseases, and benign and malignant oral neoplasms will be discussed in detail, and their clinical and microscopic characteristics illustrated with slides. Lectures will be correlated with case presentations, microscopic seminars,

and round table discussions. Quotas have been assigned to various District Dental Officers. Applications should be submitted to: Chief, Bureau of Medicine and Surgery (Code 6) via the appropriate District Dental Officer.

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"The Navy Dental Corps" - A New Film

The U.S. Navy Dental Corps exhibited its new motion picture, "The Navy Dental Corps," for its first public showing at the Centennial Session of the American Dental Association in New York City. This film portrays the professional and family life of a young Navy Dental officer from the time just prior to his being ordered to active duty upon graduation from dental school through an interval of approximately five years. His early training, various duty assignments, postgraduate education, and finally, duty at the U.S. Navy Dental School, National Naval Medical Center, are shown. The filming took place at the NNMC, at naval facilities in the San Diego, Calif., area, and in some instances, in the homes of Dental officers.

Information regarding this film or its use may be obtained by writing to: Chief, Bureau of Medicine and Surgery (Code 6), Navy Department, Washington 25, D. C., or to the appropriate Naval District Film Reference Library.

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Personnel News

RADM C. C. DeFord DC USN has relieved CAPT R. S. Snyder, Jr., DC USN as Inspector General, Dental. CAPT Snyder will serve as Assistant to the Inspector General, Dental. RADM DeFord, with LCDR R. E. Ricker MSC USN, Administrative Assistant to the Inspector General, Dental, will join the Inspector General, Navy, in October, in conducting a comprehensive survey of Eastern Atlantic and Mediterranean dental facilities.

LTCOL Dominador G. Santos, President, Philippine Dental Association, and Chief Dental Surgeon of the Philippine Constabulary, and Doctor Lorenzo G. Almeda, President, Manila Dental Society, Philippines, recently visited RADM C. W. Schantz DC USN, Assistant Chief, Bureau of Medicine and Surgery (Dentistry), and Chief, Dental Division, and his staff.

RADM C. W. Schantz DC USN was delegate for the Navy and represented the Secretary of the Navy at the Centennial Session of the A. D. A. in New York City, 14 - 18 September 1959. CAPT A. R. Frechette DC USN, Deputy Chief of the Dental Division served as alternate delegate to the meeting. The Navy

Dental Corps was represented in various committee hearings by the following officers:

Federal Dental Service	RADM C. W. Schantz DC USN, and
	CAPT A. R. Frechette DC USN
Dental Education	CAPT E. G. F. Pollard DC USN
Dental Research	CAPT J. A. English DC USN
Public Health	CAPT W. R. Stanmeyer DC USN
Hospital Dental Service	CAPT R. G. Gerry DC USN

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RESERVE



SECTION

Tables of Organization for Naval Reserve, Fiscal Year 1960 BuPers Instruction 5400.1H, 1 July 1959

(Continued from Medical News Letter, 2 October 1959)

6. Command Pay. Commanding Officers of pay units of the Selected Reserve except Commanding Officers of those units which are established on a district-wide quota basis, are authorized to receive compensation for the performance of the duties of command, including the proper administration of their units, at the rate per annum set forth in the following table:

<u>Total Allowances</u>	<u>Command Pay Authorized</u>
*\$100 or more	\$240
50 to 99	180
25 to 49	120
10 to 24	72

* NOTE: Brigade, Battalion, and DE Division Commanders in all cases command organizations of more than 100 personnel.

The appointment of an officer as Commanding Officer of a pay unit of the Selected Reserve does not automatically entitle him to receive compensation. If the officer concerned has not, in the opinion of cognizant Commandant or Chief of Naval Air Reserve Training, performed these duties in satisfactory manner, command pay shall not be paid to him.

7. Pay Status of Members of Specialist Units and Officer Schools, and Requirements for Conforming Units

a. Specialist Units Other than NROS

(1) Pay billets are authorized for the Commanding Officer and certain staff members of specialist units as compensation for the faithful performance of duties in connection with the administration and training of their units. Commanding Officers will be designated only by Naval District Commandants. Staff members will be designated by Commandants, based on recommendations of Commanding Officers concerned. Staff members may include commissioned officers, warrant officers, or enlisted personnel. Duties which staff members perform will include such billets as Executive Officer, Training Officer, Personnel Officer, Instructor, et cetera. Orders to Commanding Officers and staff members will be prepared on Form NavPers 3090, Naval Reserve Inactive Duty Training Orders. It is desirable that staff member pay billets be rotated from time to time among various members of the unit in order to provide greater variety of training; however, such rotation should not normally take place more often than once annually for each billet.

(2) Limitations. Any Specialist unit which has an enrolled membership of fifteen (15), but not more than twenty-nine (29) members, qualifies for pay status for the Commanding Officer and one (1) staff member. For each additional fifteen (15) members, over and above the original fifteen (15), pay status is authorized for one (1) additional staff member; however, no more than five (5) pay billets are authorized for any Specialist unit. Commanding Officers and staff members shall not receive pay for more than a total of 24 drills annually, such total to be based on no more than eight drills per quarter. In order for Commanding Officers and staff members to be eligible for compensation as outlined herein, the combined membership of the unit with which they are affiliated must maintain a minimum attendance of 75% per quarter, such percentage to be based on attendance at all drills scheduled by the unit concerned for that quarter. The performance of equivalent drills may be included with regular drills in computing unit percentages of attendance. Drills missed as a result of active duty for training may be counted as "present" for this computation. Pay billets for all Specialist units will be limited to quotas established by Table 25. Attendance by U. S. Marine Corps and U. S. Coast Guard Reservists may be included in percentage computations; however, attendance by personnel of the Reserve components of other branches of the Armed Forces may not be included.

b. Naval Reserve Officer Schools. Pay billets are authorized for directors and for staff and faculty members of Naval Reserve Officer Schools. These billets will be limited to the quotas established in Table 24 and will be administered and regulated in accordance with BuPers Instruction 1520.33A.

c. Conforming Units of the Specialist Reserve. Units of the Specialist Reserve complying with the following stated provisions, as determined by the cognizant Commandant, will be considered "Conforming Units." (1) The authorized number of drills were scheduled and conducted. (2) The approved training program was followed. (3) Each drill period was of at least two hours' duration.

Units that are not determined to be "Conforming Units" will be considered to be "Non-Conforming Units." Neither retirement point credit nor pay is authorized for any member of a "Non-Conforming Unit" for the period that the unit was determined to have been non-conforming.

8. Establishment and Activation or Commissioning of Units

a. Naval Reserve Programs (less aviation)

(1) Definitions. For the purpose of Naval Reserve Programs administration, the following definitions shall apply:

(a) Establish. The granting of authority to form a Naval Reserve unit at a specific location with a prescribed allowance.

(b) Activate. The granting of authority to commence prescribed training and carry out normal administrative functions by a specific unit.

(2) Authority. Selected Reserve units may be established and activated only by authority of the Chief of Naval Personnel. Authority to establish units of authorized Specialist Programs is vested in the Chief of Naval Personnel. Authority to activate established Specialist units is delegated to cognizant Commandants.

(3) Procedure

(a) Establishment. All requests for establishment of units shall be submitted to the Chief of Naval Personnel and shall include the following information:

1. Desired location
2. Desired date
3. Proposed size
4. Proposed identifying number
5. Proposed drill night (not necessary if multiple drills

are contemplated)

6. Statement as to adequacy of training facilities, equipment, and number of stationkeeper personnel available to support the unit. Requests for establishment of Reserve Crews shall include a report of availability of suitable and adequate berthing facilities, including dockside utilities, where applicable.

(b) Activation. All requests for activation of Selected Reserve units shall be submitted to the Chief of Naval Personnel and shall include the following information:

1. Desired date
2. A roster of officers that are pledged to enroll. (Form

NavPers 353 shall be used.)

3. The number of enlisted personnel, by rating and pay grade, and that are pledged to enroll. (Names are not necessary.)

(It should be noted that the granting of authority to establish a Selected Reserve unit does not automatically grant authority for activation. Requests for concurrent establishment and activation may be submitted, but must contain all the information required above.)

b. Naval Air Reserve Programs

(1) Definitions. For the purpose of Naval Air Reserve Programs administration, the following definitions shall apply:

(a) Commission. The granting of authority to commence prescribed training and carry out normal administrative functions by a specific unit and the imposition of responsibility therefor.

(b) Activate. The transfer to full time active duty status of Naval Air Reserve unit.

(2) Authority. Naval Air Reserve Program units may be commissioned only by authority of the Chief of Naval Operations.

(3) Procedure. Precommissioning and activation procedures shall be as prescribed by the Chief of Naval Operations.

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American Board Certifications -
Inactive Reserve Officers

American Board of Dermatology

LT Evans S. Farrington (MC) USNR
LT Howard S. Yaffee (MC) USNR

American Board of Internal Medicine

LTJG Lawrence F. Blackburn (MC) USNR
LTJG Warren W. Cline (MC) USNR
LT Harry L. Davis (MC) USNR
LT Robert E. Doan (MC) USNR
LT Harold W. Evans (MC) USNR
LTJG John L. Magness (MC) USNR
LT Richard L. Sterkel (MC) USNR

American Board of Obstetrics and Gynecology

LTJG George L. Austin, Jr., (MC) USNR
LCDR John K. Cox (MC) USNR
LCDR Howard E. Milliken, Jr., (MC) USNR

American Board of Orthopedics

LT Leo B. Meyer (MC) USNR

American Board of Pathology

LT Lewis Brooks (MC) USNR
LT Harry M. Carpenter (MC) USNR
LT Edward M. Kelman (MC) USNR

American Board of Pediatrics

LT George W. Bean (MC) USNR
LT Jack P. Keeve (MC) USNR

American Board of Psychiatry and Neurology in Psychiatry

LT Claude B. Henderson (MC) USNR
LT Edwin C. Moore (MC) USNR

American Board of Surgery

LCDR William A. Cherry (MC) USNR
LT Walter S. Henley (MC) USNR
LCDR Harry N. Iticovici (MC) USNR
LCDR Thomas C. Lyons (MC) USNR
LCDR William M. Moss (MC) USNR
LT Robert L. Tornello (MC) USNR

American Board of Urology

LT Lawrence J. Morin (MC) USNR

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Convention of Association of Military Surgeons

The Association of Military Surgeons will hold their annual convention at the Mayflower Hotel, Washington, D. C., 9 - 11 November 1959. This meeting will have as its theme, "Practice of Military Medicine - Broadening Concepts," and will present subjects which will afford those in attendance an excellent opportunity to remain abreast of the latest developments in military medicine. Eligible inactive Naval Reserve Medical Department officers may earn one retirement point credit for attendance at each daily session provided they register each day with the military representative present.

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Policy

The U.S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

AVIATION MEDICINE DIVISION



The Cardiac Stress Two-Step Test

Cardiac stress tests are used for the purpose of evaluating the presence of cardiac disease not detectable by other means. Such a test should not be done indiscriminately in the presence of a resting abnormal electrocardiogram (ECG) or clinically established cardiac disease. It should not be performed in the presence of premonitory pains of impending myocardial infarction or in a subject experiencing the first episode of angina. The latter event may represent acute infarction.

If it is elected to perform an exercise tolerance test, it should be done in a standardized manner that permits comparative clinical evaluation. A complete 12-lead resting ECG (I, II, III, aVr, aVl, aVf, and 6 V leads) should be taken prior to testing. The standard test is given according to the method of Master (Am. Heart J., 10:495;1935). The subject makes a given number of trips across two standard steps in accordance with age, sex, and weight. Each of the two steps is 9 inches high, 8 to 10 inches deep, and 18 to 27 inches wide. An ascent or trip is made by going up one side of the two steps and down the other. The return trip constitutes the second ascent. With a single two-step test, the number of ascents must be completed in a minute and a half; with the double two-step test, twice the number given for the single test, the number of ascents is completed in 3 minutes.

The test is performed in the fasting state with smoking interdicted for several hours. Preferably, the patient should not be under the influence of cardiovascular drugs at the time of the test. If so, medication should be indicated (on the report).

The object of the test is to detect changes in the postexercise ECG that were not present in the resting tracing. For this purpose, it is desirable to record after exercise a minimum of leads—I, II, III, and precordial leads V2 and V5. These should be recorded immediately after exercise, 2 minutes, 5 minutes, and 8 minutes after exercise. In the event the tracing has not returned to normal by 8 minutes, subsequent records should be taken until the tracing has returned to its resting level.

During the performance of the test a physician should be readily available. If there is clinical reason to suspect coronary artery disease, it is advisable to begin with a single two-step test; in the event that it is not

abnormal, a subsequent double two-step test may be performed. A doctor should be in immediate attendance if there is any suspicion of coronary artery disease. A period of at least 2 hours should elapse between the two tests. The test should be terminated immediately upon the development of suspicious symptoms or pain on the part of the examinee.

For subsequent evaluation of such test procedures, it is imperative that the examining physician clearly indicate the following: (1) number of steps taken; (2) length of time taken for the two-step test; (3) identification of each lead used in the test; (4) identification of the resting ECG; and (5) exact time of recording of each postexercise tracing, e. g., immediate, 2-minute post-exercise.

It is emphasized that the performance of the exercise tolerance test is not considered to be a routine procedure. When a test is interpreted as being positive, the criteria for making this diagnosis should be given under the interpretation section of the Standard Form 520, Electrocardiographic Report.

Considerable variation in interpreting the criteria for a positive exercise tolerance test exists. When minor changes are considered as positive, a large number of normal subjects will have a positive test. Using more exacting requirements, some individuals with coronary artery disease will have a normal response. It should be remembered that some individuals with coronary artery disease will have normal responses by all available criteria, and variations in tests done on the same subjects from one time to the next are to be expected.

Changes in the amount of stress to extreme degrees can result in electrocardiographic changes in greater numbers of normal subjects.

At present, the criteria of Manning (*Am. Heart J.*, 54:923; 1957), Mattingly (Research Report No. 75-57, Walter Reed Army Institute of Research, May 1957), and Lepeschkin (*New England J. Med.*, 258: 511; 1958) provide a basis for reasonably accurate interpretations.

Mattingly's criteria are: (1) " . . . the best and probably the only valid criteria for a positive test indicative of coronary insufficiency in the post-exercise electrocardiogram was found to be ischemic ST segment depression in excess of 0.5 mm. in any lead. (2) Transitory ST junction depression after exercise is usually a normal finding. ST junction depression persisting several minutes after exercise and return of the heart rate to normal may be due to myocardial anoxia in exceptional cases. (3) Isolated T-wave alterations in the postexercise electrocardiograms are not valid evidence of coronary insufficiency. "

The criteria of Manning are included in his comments: "False segment depressions in the tracing immediately following exercise and variations in the T-wave in the normal were frequent. The only valid change in the post-exercise tracing that constitutes a positive response is a flat depression of the RS-T segment as compared to the P-R segment which subtends to an angle of 90° or more with the vertical and persists to at least the 2-minute tracing.

A depression with these characteristics of 1 mm. constitutes, we feel, an unquestionably positive response. Depressions ranging from 0.5 to 1 mm., provided they possess the true flat characteristics, are considered questionable and likely positive."

The criteria advocated by Lepeschkin are given in his comment: "The combination of criteria for a positive test that gave the least amount of overlapping, being present in 94% of the true and in only 23% of the false tests is as follows: inversion of the T-wave in lead I or depression of the ST segment junction beyond the continuation of a PR interval of 0.75 mm. or more, the return of the ST segment to the baseline at this time taking place in the second half of the QT interval, and ST segment depression of 0.5 mm. or more lasting for 2 minutes or more."

In recommending the interpretation to be used for flying personnel, one may use the three above expressed opinions. Care should be taken to not interpret exercise records which have significant baseline ST segment elevations commonly seen in young individuals, as many of these will produce false positive responses. It is suggested that, for the present, a positive test be one which has 1 mm. of ST segment depression in any lead as long as the ST segment depression is a flat or plateau change and is depressed compared to the PR segment or is progressively slanted downward after the onset of the initial depression. Borderline tests should consist of plateau ST segment depression of 0.5 mm. to 1.0 mm. in any lead.

It should be remembered that large changes in ST segments, T-waves, and P-waves frequently occur in the standing position. All criteria for exercise changes in the electrocardiogram must be based on records taken in the recumbent position.

* * * * *

Pressure Changes in the Middle Ear After Flight

When a pilot ascends or descends in the atmosphere he is exposed to a continually changing environmental pressure. The pressure of gas in the middle ear space, however, does not exactly follow that of the atmosphere, but does so in a discontinuous, stepwise manner owing to resistance in the sole communicating channel, the Eustachian tube. Therefore, intermittent pressure differentials build up between the inside and outside of the ear. Normally these are felt as no more than a sense of fullness during ascent and suction during descent, followed in either case by an intermittent sense of "clearing" at re-establishment of equilibrium. Owing to a nonreturn valve defect in the Eustachian tube, clearing sometimes proves difficult during descent and at such times suction can develop causing deafness, pain, retraction, and congestion of the eardrum, middle ear effusion, and sometimes in severe cases, rupture of the eardrum. Occasionally, vertigo is experienced at the

moment of clearing. During flight the pressure differentials which give rise to these conditions are due to alterations in atmospheric pressure. During flight the gas content of the middle ear remains relatively constant.

Following the use of 100% oxygen in flight, it is common to experience similar sensations, sometimes leading to delayed signs and symptoms, after landing. With no further flying, the subjective magnitude of the delayed effect gradually decreases until after 24 hours they are usually no longer noticeable.

Since oxygen is absorbed through the mucous membrane of the middle ear and sealed to escape from the vascular network of the mucous membrane the composition of the gaseous mixture in the middle ear varies from that in the atmosphere. The estimated composition of middle ear equilibrium gas mixture is shown in the table.

<u>Gas</u>	<u>Partial Pressure</u> (mm. Hg.)	<u>Percentage Content</u> <u>by Volume</u> (At. - 760 mm. Hg.)
Oxygen	66	8.7
Water vapor	47	6.2
Carbon dioxide	50	6.6
Nitrogen	597	78.5

Experiments have been conducted which show that after flight using 100% oxygen there is a tendency for the middle ear pressure to fall below that of the atmosphere. The observed rates of fall are small but they are persistent, and in the event of failure to establish communication between middle ear space and nasopharynx, considerable suction can develop. In this event, middle ear trauma could ultimately occur and it seems probable that herein lies the physical cause of the delayed signs and symptoms previously mentioned.

It has been shown that the main cause of the observed physical findings is absorption of oxygen from the closed middle ear space. The fall in pressure in the middle ear is delayed until 30 to 40 minutes after final descent. This is due to the saturation of the gas with water vapor which rapidly develops to 47 mm. Hg. Carbon dioxide diffuses from the tissue to form an equilibrium of approximately 30 to 40 minutes. Nitrogen is diffused into the middle ear at a rate of approximately 0.3 ml. /hr. Oxygen is absorbed at a rate of approximately 3 ml. /hr. The differences in rate of diffusion of these two gases would therefore account, in the event of a closed Eustachian tube, for the difference in pressure which develops in the middle ear over the following 24-hour period.

Trauma liable to be incurred by development of absorption of such excess oxygen is essentially acute in onset and mechanical in nature. It is possible that the high concentration of oxygen exerts a toxic influence upon the mucous membrane and, since above normal concentrations may remain for over 24 hours after flight, it can be appreciated that the middle ear of an aviator engaged in regular flying duties is liable to be continually exposed to this influence over long periods of time. This condition can be extended to a partially obstructed nasal sinus where a similar situation could obtain.

With greater use of continuous flow oxygen regulators which provide 100% oxygen, it is possible that the incidence of delayed aero-otitis media among pilots may increase. As a preventive measure, it is suggested that pilots who are frequently required to use 100% oxygen in flight be instructed in the use of the reverse Valsalva maneuver. This maneuver should be used immediately after landing and again 30 minutes later. A reverse Valsalva maneuver produces negative pressure within the nasal and buccal cavities emptying the middle ear of the 100% oxygen trapped there. This is done by taking a mouthful of water, firmly closing the mouth, holding the nose tightly shut, then swallowing the water. After taking a breath, the air pressure in the middle ear can be equalized with ambient air by performing the Valsalva maneuver. (B. Melville Jones, Pressure Changes in the Middle Ear after Flight (abstracted in part): Institute of Aviation Medicine, RAF, Farnborough).

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Correct Parachute Descent and Landing Procedures

The Bureau of Aeronautics has a new training film MN 9299b, "Parachute Landing Techniques," which will be released soon. The correct techniques shown therein are the result of a BuAer requested study at the Naval Parachute Unit.

To assist in survival, BuAer is also changing the attachment of the PK II so that it can be reached. A bulletin is in preparation.

It has been emphasized that pilots do not know their equipment well enough to handle emergencies by reflex action. The triad is (1) Practice, (2) PRACTICE, (3) P-R-A-C-T-I-C-E!!! Here are the procedures:

DESCENT OVER LAND - STANDARD HARNESS. When the standard parachute is used (either the back, chest, or seat type) without a life raft, and bailout is made over land, the jumper is concerned with landing in suitable terrain and getting free of harness and parachute if there is danger of being dragged by winds.

1. The parachutist should not attempt to get into a sitting position.

Landing in the seated position on land can cause serious injury if his legs tuck under him.

2. Hold both hands on the risers, feet apart 12"-18" and knees slightly bent just prior to touch down. This allows the man to hang limp in the harness and take most of the ground impact with his legs.

3. As soon as the feet touch the ground, tumble in the direction of the fall. Do not attempt "stand-up" landings.

4. When a strong wind is blowing the jumper should deflate his canopy immediately. This can be accomplished by pulling in on the suspension lines closest to the ground.

DESCENT OVER LAND - INTEGRATED HARNESS WITH CANOPY RELEASE

1. If the parachute was opened automatically, the manual ripcord must be pulled from the pocket during descent to insure immediate separation of the jumper from the canopy. The left riser will not be free of the pack until the ripcord housing is pulled free from the riser.

2. The canopy releases should be actuated immediately upon touching the ground. The canopy is now completely free of the jumper.

3. The seat pan and paraft assembly are removed by releasing the lap belt fittings.

DESCENT OVER WATER - STANDARD HARNESS. A water landing presents an additional survival problem. Familiarity and practice with the equipment will greatly increase a man's chances of survival.

1. Do not attempt to sit back in the harness. The time spent attempting this feat can be better spent preparing for the landing.

2. Check the paraft lanyard to be certain that it is attached to the life vest and is routed under the leg strap. The loss of the survival kit and paraft may mean the difference between life and death.

3. The chest strap should be unsnapped, and risers grasped overhead. This will aid in quick escape from the harness when entering the water.

4. Just prior to feet touching the water, the hands should be placed over the leg ejector snaps. Do not release snaps until actually in the water.

5. Release both leg ejector snaps immediately upon entering the water.

6. Inflate the life vest, regardless of whether the harness and canopy are completely free. By following the paraft retaining line, remove and inflate the paraft.

It is not recommended that the paraft be removed from its container while descending. The raft may "fall up." This introduces the possibility of the raft and sea anchor entangling with the canopy and suspension lines of the parachute.

DESCENT OVER WATER - INTEGRATED HARNESS AND CANOPY RELEASE

1. If the parachute was actuated by an automatic parachute actuator, it must be remembered to remove the manual ripcord from the pocket, preferably during descent, to insure separation of jumper from canopy.

2. Unhook the left lap belt fitting. The pararaft kit will hang from the right fitting and be more easily accessible when in the water.

3. The parachutist must check pararaft lanyard to be sure that it is attached to the harness. This will insure retention of raft when it is removed from the survival kit.

4. Position the hands on the risers adjacent to the canopy releases and release the canopy releases immediately upon entering the water.

5. Inflate the life vest by a positive jerk on each toggle, then remove and inflate the pararaft.

Do not inflate the M3C life vest prior to entering the water.

These procedures have been laboratory tested, used by test jumpers under all conditions of land and water descents, and have been successfully used by fleet pilots and crewmen when their lives depended upon them.

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Candidates Physically Disqualified on Final Examination at Pensacola

Of the last class of student naval aviators reporting to Pensacola for flight training, 15 were rejected because of defective auditory acuity. This late development disrupts the individual's plans, causes embarrassment to the individual, creates hard feelings toward the Navy, and results in a useless expenditure of Navy money. It is imperative that a candidate for flight training be given a careful, thorough original examination and that all disqualifying defects be discovered at that time. The examining flight surgeon is not doing the individual or the Navy a favor by passing a questionable or failing candidate in the hope that he may slip through the examination at Pensacola. The best interest of all parties concerned is served by eliminating the physically or aeronautically unfit as soon as possible.

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Physical Qualifications for Assignment to Naval Air Technical Training Unit Schools

It has been reported that an increasing number of students are reporting to the Naval Air Technical Training Unit Schools who do not meet the visual or other physical requirements for this assignment. Article 15-69 (10), Manual of the Medical Department, describes the physical qualification requirements.

The Official Bulletin of Schools and Courses, Fiscal Year 1960 Edition, issued by the Naval Air Technical Training Command specifies on page 4 under

"Qualifications and Service Requirements" that "in selecting personnel for transfer, Commanding Officers must comply with the qualifications for eligibility." Page A-3 of this publication states in part that the candidate "must meet the physical requirements for Air Controlman as set forth in the Manual of the Medical Department. Students entering the school must possess written proof of physical qualification, statement from a flight surgeon (Standard Form 88). . . . This evidence is required by the FAA for CTO examinations. . . ."

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Completion of Standard Form 88

Many reports of physical examination on Standard Form 88 are being received in the Bureau of Medicine and Surgery with inaccurate or incomplete information. Much time and money are lost by these practices. The examining or reviewing flight surgeon should review the SF 88 at the time of signing to check the accuracy of all recorded findings so that BuMed may intelligently inform BuPers of the pilot's flight status. It is not generally understood that frequently BuMed also must answer congressional inquiries regarding the physical condition of naval aviation personnel. All too often there is an embarrassing lack of information. Then, the Bureau has no recourse but to return the SF 88 for completion. Forms are frequently received with Item 5, "Purpose of Examination," filled in with "Post Hospitalization" without further explanation. It is necessary to include such information as whether the examinee was hospitalized for medical or surgical reasons, dates of hospitalization, and complications. If the flight surgeon, on preparing the SF 88, will keep in mind that a letter may have to be written to BuPers or to a Congressman based on the information furnished, he can frequently anticipate BuMed needs and give full facts, including summary of hospitalization, consultation reports, et cetera, at the time of examination.

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Accident Reports

The Medical Officer's Report of Aircraft Accidents/Incidents and Ground Accidents continues to be received at the Naval Aviation Safety Center submitted on the old form (OpNav Form 3750-8 Rev. 2-54). This poses a very difficult situation in the coding and analysis of the information contained in the MOR. These reports should be submitted on OpNav Form 3750-8 (Rev. 5-58). Difficulty in obtaining the new forms has been attributed to overstocking of this form by a few activities.

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Message from the Surgeon General

A letter has come to me from a Naval Reserve Medical Officer who recently completed his active duty. He expressed deep appreciation and gratitude for the excellent indoctrination and guidance he received from a Medical Service Corps officer. The writer sums up his reaction by saying, "Through his example and advice I gained an enthusiastic appreciation of our Navy, its Medical Corps and its Medical Service Corps."

It is most gratifying to receive such a communication. It is concrete evidence of the effectuation of our continuing policy of helpfulness to newly enrolled Medical Department officers, particularly during the days of their adaptation to the Navy environment. Medical Service Corps officers are particularly well equipped to be of assistance in this direction. Such performance on their part goes far in promoting the satisfactory service of others in the Medical Department.

It is well to note that the officers who are so helpful in this regard are always those who are very competent in their total performance. This is pointed up by the Medical officer who wrote the letter at hand when he said, referring to the officer he was commending, "his administrative ability and his intimate knowledge and sincere appreciation of each organization's objectives, capabilities, and limitations was, in my opinion, exemplary."

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